

REMARKS

Reconsideration and allowance of the subject application are respectfully requested.

Upon entry of this Amendment, claims 6 and 8-10 are pending in the application. In response to the Office Action, Applicant respectfully submits that the pending claims define patentable subject matter.

Claims 6 and 8-9 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Inoue (USPN 4,448,655, hereinafter “Inoue ‘655”) in view of either Rocklin (USPN 4,551,603, hereinafter “Rocklin”) or Inoue (USPN 4,346,281 hereinafter “Inoue ‘281”). Claim 10 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Inoue ‘655 in view of Rocklin or Inoue ‘281, as stated above, and in further view of Bonga (USPN 4,645,894, hereinafter “Bonga”). Applicant respectfully traverses the rejections.

In the Response filed October 9, 2008, Applicant submitted that independent claims 6 and 10 would not have been rendered obvious in view of the Examiner’s proposed combination of Inoue ‘655, Bonga and Scarpelli because the Examiner proposed modification of Inoue ‘655 would impermissibly change the principle of operation of the Inoue electrode. In particular, modifying Inoue ‘655 by adhering a surface discharge processing material in recesses of the rugged peripheral surface of the wire electrode of Inoue ‘655 would fill in (flatten) the recesses such that the peripheral surface is no longer rugged (i.e., the surface would tend to become smooth). As a result, the surface of the wire electrode would no longer facilitate the detachment of the gaseous bubbles from the machining surface of the wire electrode (Inoue teaches that the wire electrode is formed with a rugged peripheral surface to facilitate the detachment of gaseous bubbles from the machining surface of the wire electrode).

Although the Examiner has posed a new grounds of rejection by replacing Bonga and Scarpelli with Rocklin and Inoue '281¹, Applicant respectfully submits that regardless of the teachings of the secondary references, one of skill in the art would not have modified Inoue '655 to produce the claimed invention. Therefore, the new grounds of rejection are equally insufficient since the Examiner has simply combined new art with the disclosure of Inoue '655.

Inoue '655 discloses a wire electrode which is formed with a rugged peripheral surface along a length thereof. As correctly conceded by the Examiner, Inoue '655 fails to teach or suggest that a surface discharge processing material is adhered to the rugged peripheral surface (i.e., projections and recesses) of the wire. Inoue '655 teaches various ways of producing the rugged peripheral surface, e.g., by electroless plating, chemical plating, electroplating, spark deposition, powder spraying, plasma-spraying, sintering, sandblasting or knurling; twisting together a group of small diameter wires; winding a small diameter wire on a large diameter core wire; and forming a spiral groove in the smooth surface of a wire by means of a rotating die. Inoue teaches that the wire electrode is formed with a rugged peripheral surface to facilitate the detachment of gaseous bubbles from the machining surface of the wire electrode. The gaseous bubbles are formed by the electrical decomposition of the machining liquid tend to be adherent on the machining surface of the electrode and thus negatively act as a thermal insulator/barrier between the electrode and the coolant machining liquid. Further, the recesses provide additional surface area in which a liquid coolant may flow to more efficiently cool the electrode. Inoue '655 teaches that by removing the thermal barrier produced by gaseous bubbles which

¹ In the previous Office Action, claims 6 and 8-10 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Inoue '655 in view of Bonga (USPN 4,645,894) and Scarpelli (USPN 3,283,116).

continually develop on the electrode surface, the thermal emission and cooling of the electrode surface is enhanced such that the elongated element is capable of carrying greater machining current without undergoing thermal destruction by the heat which develops by the passage of the greater current. The eventual result is a marked increase in removal rate and hence marked shortening of the total machining time required to accomplish a given machining operation.²

Thus, as previously submitted, Inoue '655 in fact teaches away from adhering a surface discharge processing material in recesses of the rugged peripheral surface of the wire electrode of Inoue '655, as this modification would fill in or flatten the recesses such that the peripheral surface would be smooth and no longer facilitate the flow of liquid coolant nor the detachment of gaseous bubbles, and therefore render the invention inoperable (MPEP 2143.01).

The Examiner cites Rocklin for disclosing an "electrode may be constructed from an intermetallic phase dispersed in a matrix of eutectic or solid solution" and asserts that "[i]t would have been obvious to ... use a ductile wire (ductile electrode) constructed of a combination of materials to deposit (reform) the worksurface, as taught by Rocklin in the Inoue ('655) apparatus because it is merely a variation of the electrode."

The Examiner cites Inoue '281 for disclosing an "electrode may be made of WC-Co and copper" and that "[t]his electrode forms metallic alloy deposition on the worksurface." The Examiner further asserts that "[i]t would have been obvious to ... use a composite electrode as taught by Inoue ('281) in the Inoue ('655) apparatus because it is merely a variation of the electrode."

² Inoue at Abstract and page 7, lines 11-30.

However, Applicant respectfully submits that it is quite clear that neither Rocklin nor Inoue '281 provide any teaching or suggestion which would motivate one of skill in the art to modify Inoue '655 by adhering a surface discharge processing material in recesses of the rugged peripheral surface of the wire electrode, even if the Inoue '655 disclosure which teaches away from such modification is impermissibly ignored. That is, the mere disclosures of Rocklin and Inoue '281 that teach that an electrode may be formed of a composite material does not in any way provide a suggestion to modify Inoue '655 to produce the claimed invention.

Furthermore, Applicant respectfully submits that it would not be obvious to modify the Inoue '655 with the teachings of Rocklin or Inoue '281. While Inoue '655 is broadly relevant to both Rocklin and Inoue '281, in that they all use an electrical discharge to modify a workpiece, Inoue '655 does not employ an electrical discharge to apply a material layer on a workpiece as is taught by Rocklin and Inoue '281. Instead, Inoue '655 employs an electrical discharge to erode a material layer of the workpiece (Column 1 Lines 13-16). Thus, modifying the teachings of Inoue '655 to deposit a material on the surface of a workpiece would again render the invention of Inoue '655 inoperable (MPEP 2143.01).

With particular regard to the electrodes, the Examiner asserts that it would be obvious to one of ordinary skill in the art to use a composite electrode as taught by both Rocklin and Inoue '281 in the disclosure of Inoue '655. Inoue '655 merely discloses an electrode that may consist of a bundle of wires twisted together to form recesses (Figure 2, 8-10) or a modification as discussed above. By combining the teachings of Rocklin and Inoue '281 with the invention of Inoue '655, one would be merely illustrating that individual wires composed of alternate

materials may be bundled together to form a composite electrode, and provide absolutely no support for adhering a material to the recess of the electrode disclose in Inoue '655.

Lastly, Applicant respectfully submits that the Examiner has not provided an objective reason why one of ordinary skill in the art would have been motivated to further modify Inoue '655 based on Rocklin or Inoue '281 to produce the claimed invention. That is, the Examiner alleged rationale (i.e., "because it is merely a variation of the electrode") is wholly insufficient to establish a *prima facie* case of obvious under 35 U.S.C. § 103. As set forth in *KSR International Co. v. Teleflex, Inc.* (*KSR*), 550 U.S. ___, 82 USPQ2d 1385 (2007), "rejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *KSR*, 550 U.S. at ___, 82 USPQ2d at 1396 quoting *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006).

Accordingly, Applicant respectfully submits that independent claim 6, as well as dependent claims 8-10, are patentable because the cited references, alone or in combination, do not teach or suggest all of the features of the claims and one of ordinary skill in the art would not have been motivated to combine and modify the cited references to produce the claimed invention.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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